

NCCS Snapshot The Week of July 21, 2008

NATIONAL CENTER
FOR COMPUTATIONAL SCIENCES



Oak Ridge National Laboratory
U.S. Department of Energy

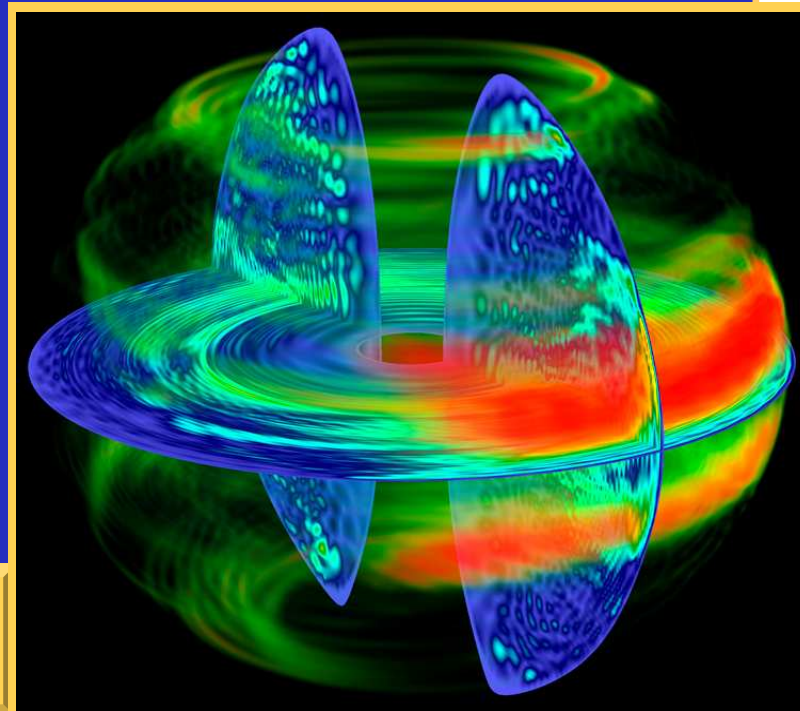
Researchers Seek *lingua franca* so Fusion Codes Can Converge in Coupled Model

- ORNL physicist Don Batchelor is creating a computational framework that will allow diverse software codes to communicate with each other in simulations of plasma
- Plasma is an ionized gas that provides the fuel for fusion energy, which if perfected could revolutionize energy production
- Getting different codes to communicate is a key process in realistic fusion simulation, itself key in unlocking the potential of fusion energy

We've developed basically a lingua franca whereby different physics codes can talk to each other."

Don Batchelor, ORNL Physicist

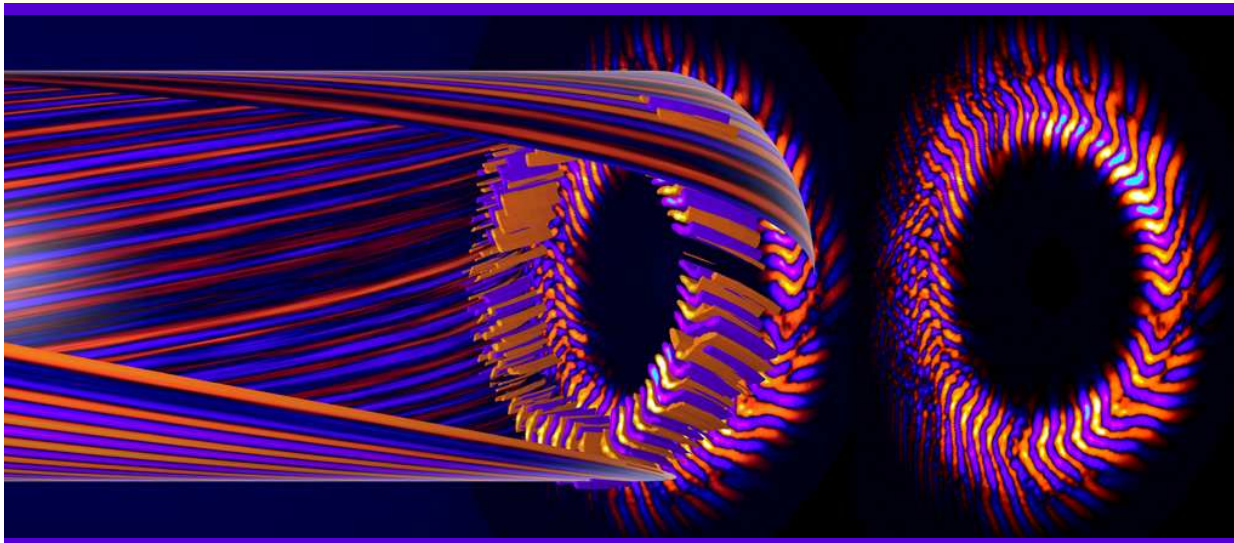
Projects explore radio frequency waves and magnetohydrodynamics in fusion plasmas



UCI Researchers, NCCS Staff Conduct Breakthrough Fusion Simulation

GTC consumes 93 percent of 263TF Jaguar

- A team of University of California-Irvine (UCI) researchers, along with NCCS staff, has just completed what it says is the largest run in fusion simulation history
- The team used 93 percent of the NCCS's flagship supercomputer Jaguar, a Cray XT4, with the classic fusion code GTC
- The simulation primarily studied electron transport in ITER, a prototype fusion reactor meant to test fusion's feasibility for commercial power production



"The success of fusion research depends on good confinement of the burning plasma. This simulation size is the one closest to ITER in terms of practical parameters and proper electron physics."

Yong Xiao, UCI researcher



ORNL Huge Presence at SciDAC 2008

- The 2008 SciDAC symposium once again showcased the numerous research achievements that have recently taken place at ORNL
- Three ORNL researchers served as session chairs and several others gave presentations, including a tutorial
- Presentations included ORNL's Bronson Messer's simulation work on core-collapse supernovas and tutorial by Scott Klasky's team on ADIOS, an adaptable I/O system

Annual symposium provides forum for latest lab achievements